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HEAVIER LORRIES FOR COMBINED ROAD/RAIL TRANSPORT

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HEAVIER LORRIES FOR COMBINED ROAD/RAIL TRANSPORT

Introduction

1. The Government wants to see industry make the best use of the rail network for freight. It is particularly keen to see rail capitalise on the potential for longer distance intermodal traffic that will be generated by the opening of the Channel Tunnel.

2. This paper proposes an increase in the weight limits of lorries carrying goods to or from railheads for combined road/rail operations as one means of attracting more freight traffic to rail.

3. Rail freight has a long history of declining output. The popular perception is that rail has progressively lost traffic to road. In reality this is not the main cause of rail freight's decline. Rail freight has lost volume with the restructuring of heavy industry and wider changes in the economy, which have led to a decline in rail freight's traditional markets. Rail has lost market share principally because road haulage has been more suitable in terms of accessibility and flexibility for the growth traffics (retail distribution, manufactured goods, etc.). Thus, although the 1980s saw a slowing of the absolute rate of decline in rail freight, the rapid growth in road haulage resulted in a continuing fall in rail's market share.

4. As in other EC countries, the bulk of overland freight goes by road – 90% in the case of the UK. As the economy has developed, a combination of rapidly changing and diverse distribution patterns, with lower volume flows and increasing reliance upon 'just in time' delivery, has made it increasingly difficult for rail to compete. Rail retains traffic today mainly in sectors where it has structural advantages over road. The keys to this are volume and, to a lesser extent, distance. For stable, consistent traffic flows involving big volumes of bulk materials, rail remains in many cases the mode of first preference. However, there are limited new market opportunities for flows of this kind. Therefore, if rail is to increase market share, it must become more competitive in those relatively new commodity sectors in which road haulage has hitherto predominated. Road congestion has to some extent focused the attention of industry on the rail option for longer trunk hauls but, up to now, companies have generally not found it worthwhile to make any substantial switch from road to rail.

5. Within British Rail's current business structure, Railfreight Distribution (RfD) seeks to attract custom in lighter volume freight markets by operating a network of intermodal or 'combined transport' freight services to provide a door-to-door service, with trunk haul by rail and collection and delivery by road. However, the relatively short trunk haulage distances in Britain, combined with the weight and handling penalties of intermodal operations, make it more difficult for rail to compete effectively in these markets. Today, the core market for BR's intermodal services is the movement of deepsea containers between inland sites and ports. However, the Channel Tunnel presents the railways with an unprecedented opportunity to capture longer distance flows of manufactured and other goods between Britain and the Continent.

Combined Transport

6. 'Combined' road/rail transport refers to the movement of goods by road and rail in a single journey. The trunk haul is by rail between termini at which traffic is brought in by lorry or transferred to lorry for final delivery to the customer. In order to reduce handling costs and time penalties, combined transport movements are unitised. Most British combined transport movements are carried out with containers – which are standardised steel boxes designed to be stacked in the holds of ships. The most common sizes are 20 and 40 feet in length. Photographs 1 and 2 show 40ft containers being transferred from road to rail.

7. On the Continent, where there are significant inland combined transport movements, the 'swap-body' has become an increasingly common sight. Unlike containers, swap-bodies are not designed to be stacked but have the advantage of lower weight (commonly steel frames with fabric covers) which means they can carry a higher net payload than containers. Their dimensions also make them more efficient than containers for carrying standard pallet sizes. Swap-bodies are little used intermodally in Britain, but it is expected that more will come into use here as the Channel Tunnel freight services develop.

8. On the Continent, short swap-bodies of between 7 and 8 metres long (see Photograph 3) are most commonly used and this is expected to be true of Channel Tunnel traffic. An articulated vehicle cannot carry two short swap-bodies because it is limited to loads 13.6 metres long but a drawbar trailer combination (a lorry towing a trailer) is able to do so because of its greater overall length. Drawbar combinations therefore enable much more efficient movement of short swap bodies by road and play an important role in combined transport on the Continent; see Photograph 4.

9. For combined transport, payload is typically constrained by the maximum permissible gross vehicle weight for the road sections of the journey because rail wagons have heavier carrying capacity than lorries. There is also the "dead weight" of the container or swap-body to be carried as well as the payload itself. The present lorry weight limits in Britain, which are lower than on the Continent, do not permit containers or swap-bodies to be loaded to their maximum weight capacity. The maximum payload of an articulated lorry in the UK is about 24.5 tonnes.

By comparison, a fully loaded 40ft ISO container can weigh up to 30.5 tonnes. Similarly, whilst two swap-bodies can be carried on a drawbar trailer combination, the maximum payload of such vehicles is about 23 tonnes (2 units of 11.5 tonnes) whereas a fully loaded short swap-body weighs 16 tonnes. A gross vehicle weight of 44 tonnes for both articulated and drawbar vehicles is the minimum that would enable fully laden 40ft ISO containers and swap-bodies to be carried.

10. In order to enable road/rail operations to operate on an equal footing with road transport in terms of available payload, the Government has considered the case for 44 tonne road vehicles carrying out journeys to and from rail terminals. The following sections consider this in more detail. It is very important to understand that **no change is envisaged to the maximum dimensions of lorries**.

Lorry Weights: Current Situation and Technical Issues

The origin of our present weight limits

11. In 1980 the maximum gross weight for an articulated lorry or a drawbar trailer combination was 32.5 tonnes. In that year the Armitage inquiry into heavy lorries recommended increases in gross weight for articulated lorries and drawbar trailer combinations up to a maximum of 44 tonnes on 6 axles (a 3 axle towing or tractor unit plus a 3 axle semi-trailer or trailer), with a maximum drive axle weight of 10.5 tonnes.

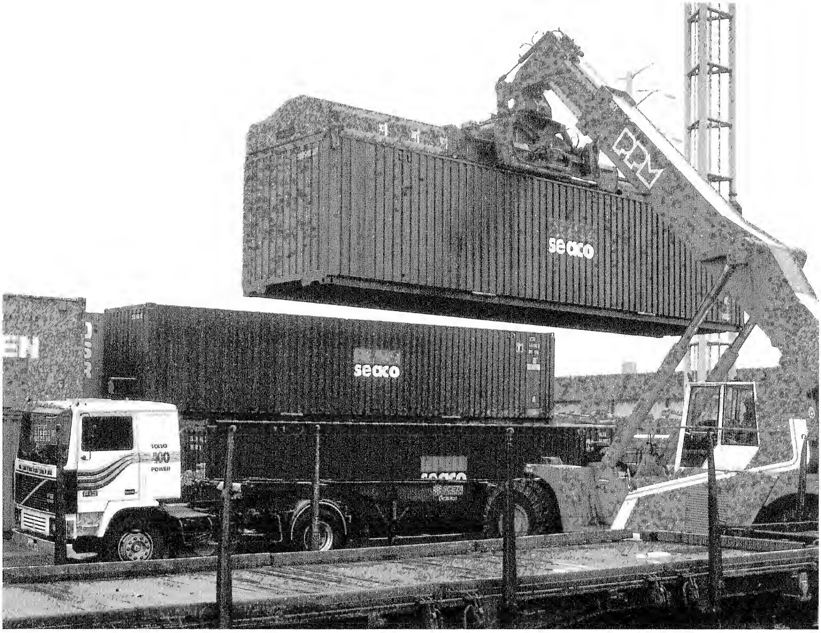
12. In 1982 the Government introduced a maximum weight for articulated vehicles (on 5 or 6 axles) of 38 tonnes and a maximum drive axle weight of 10.5 tonnes. The limit for drawbar trailer combinations remained at 32.5 tonnes.

The EC position

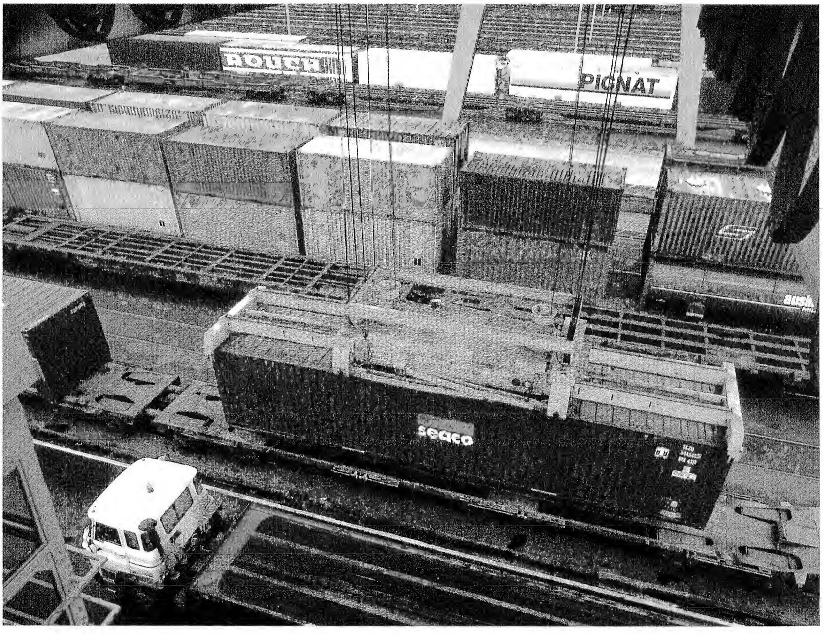
13. In 1984 EC Directive 85/3 set 40 tonnes as the general maximum gross weight for articulated vehicles and drawbar trailer combinations with 5 or more axles used in **international** haulage and 44 tonnes for articulated vehicles with a 3 axle tractor unit carrying a 40 foot ISO container in combined transport. The EC drive axle weight limit has been 11.5 tonnes since January 1992. Some EC countries allow higher gross weights for domestic operations.

14. The UK secured a derogation from the provisions of EC Directive 85/3 allowing it to maintain its present weight limits, of 38 tonnes for articulated vehicles and 10.5 tonnes for drive axles until January 1999.

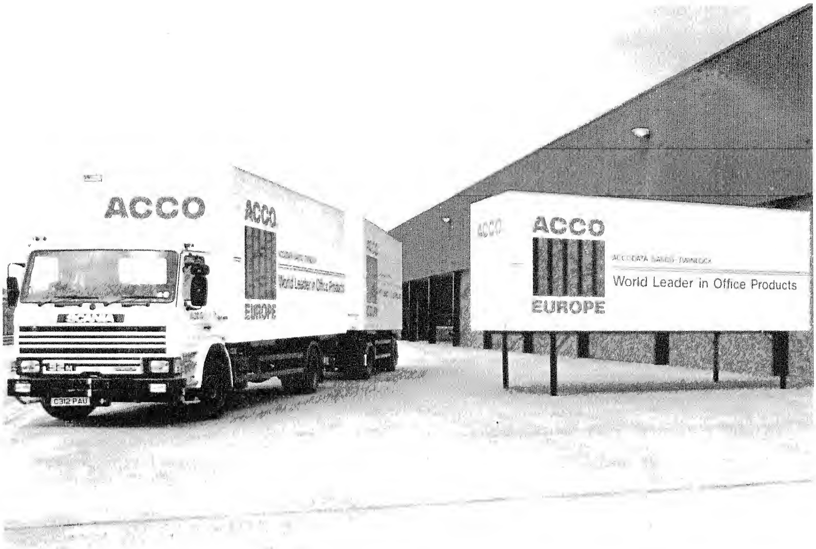
15. Drawbar vehicles were restricted to 32.5 tonnes in the UK because of perceived public concern at the time of the Armitage Report over their greater length (at that time 18 metres compared with 15 metres for articulated vehicles). Since then the length differential has narrowed – the present EC length limit for drawbar combinations is 18.35 metres compared with 16.5 metres for an articulated vehicle. Moreover, trials conducted by the Transport Research Laboratory in 1987 showed that public attitudes were partly based upon a lack of knowledge about the manoeuvrability of drawbar vehicles. In fact, drawbar vehicles take up less road space when cornering than articulated vehicles. Under the terms of the EC Directive, the weight limit for drawbars was raised to 35 tonnes from 1 January 1993.



Photograph 1: A 40ft container being transferred from road to rail.



Photograph 2: A 40ft container being transferred from road to rail. 20ft containers are stacked in the background.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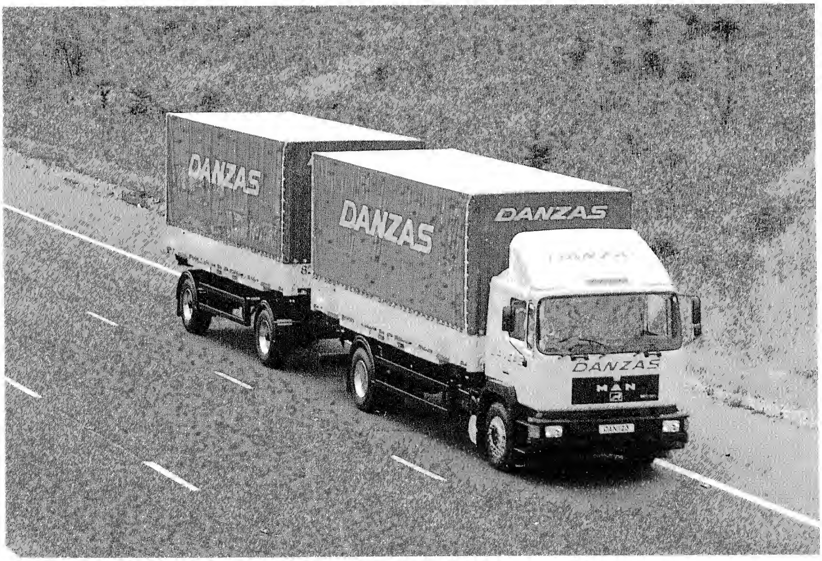
Photograph 3: Short swap-bodies; with legs in lowered position (right) and two loaded on a drawbar trailer combination (left).



Photograph 4: Drawbar trailer combination carrying two short swap-bodies.

16. Appendix 1 shows the lengths and gross weights for the relevant articulated and drawbar trailer combinations.

The impact of weight on roads and bridges

17. The major consideration in deciding what lorry weights to allow is the impact of heavy lorries on roads. The force transmitted to a road by a vehicle depends on its total weight and how that load is spread via the axles to the road surface. It is the weight on each axle, rather than gross weight as such, that determines the amount of road wear.

18. Road wear is approximately proportional to the weight of an axle raised to its 4th power. Thus, an 11.5 tonne axle does about 45% more damage than a 10.5 tonne axle. There is thus an advantage to be gained in spreading loads evenly and thereby avoiding very heavy individual axles. Consequently our domestic regulations on weights and dimensions of vehicles specify maximum gross weight, maximum axle weights and minimum spacings between axles.

19. A further factor in reducing road wear is the efficiency of the vehicle's suspension in preventing large dynamic axle loads from being passed to the road by a moving vehicle. When a vehicle is moving it has a tendency to bounce up and down over irregularities on the road surface. This motion results in dynamic loads on an axle greater than the static load. If the vehicle is fitted with a suspension system consisting of soft springs and good dampers then the dynamic loads are considerably reduced. Air suspension, which is a relatively recent development, is probably the best example of such 'road friendly suspension'. Research at the Transport Research Laboratory shows that fitting such suspensions gives an 8% reduction in road wear from the drive axles of vehicles and a 10-20% reduction in road wear from semi-trailer bogies.

20. The road wear caused by the relevant vehicles is shown in Appendix 2. A fully laden 44 tonne vehicle on 6 axles with road friendly suspension will cause no more road wear than the 38 tonne, 5 axle vehicles we already allow.

21. Bridges must be able to carry permitted vehicles with adequate margins of safety. A major bridge assessment and strengthening programme is at present under way in Great Britain which will ensure that all bridges meet minimum standards. This work will also mean that our bridges will be capable of carrying the heavier

vehicles to be allowed on our roads by January 1999. For bridges, safety depends on new vehicles not exceeding the parameters against which bridges are presently being checked. Limiting axle weights and spacings and spreading loads over a number of axles are as important for achieving adequate bridge safety, particularly for short span bridges, as they are for minimising road wear. Gross weight is more relevant for longer span bridges, where the total potential weight on the bridge in a static jam is an important consideration. The greatest weight for a given length of vehicle is produced by certain types of short wheelbase 30.5 tonne vehicles already in use. A number of these nose to tail on a bridge would produce a higher total loading than the lesser number of 44 tonne vehicles that would occupy the same distance.

The Proposed Change

22. **The Government proposes that 6 axle articulated vehicles and drawbar trailer combinations fitted with road friendly suspensions should be allowed to operate at 44 tonnes but only when carrying out journeys to or from rail terminals.** These vehicles would be required to meet existing maximum axle and bogie weights and, although having minimum axle spacings greater than currently required, would still have to meet existing turning circle requirements. The proposal would allow road/rail operations to operate on an equal footing with road transport in terms of available payload whilst ensuring that the road vehicles caused no more road wear than present vehicles.

23. The higher weight limit would be subject to a requirement that the consignment goes by rail for trunk haul and that operators use the nearest suitable intermodal rail freight terminal for collection and delivery. The new limit would not therefore apply to the Channel Tunnel shuttle.

24. Any system of differential weight allowance for vehicles in combined transport would have to be enforceable to prevent the higher limits being used for other purposes. It is proposed therefore that, in order to qualify for the higher weight limit, the driver of such a vehicle would have to have a consignment note which would show that the cargo had originated from, or was destined for, a rail terminal.

25. The fact that a 44 tonne 6 axle lorry would cause no more road wear than the present largest vehicles could be used to argue the case, on grounds of efficiency, for their use in road haulage generally. The Government takes the view, however, that positive measures are needed to help rail freight and this proposal is therefore directed at combined transport.

26. Nevertheless, the Government sees no reason to continue to discriminate against drawbar trailer combinations in relation to articulated vehicles for general haulage. **It is therefore proposed to allow drawbar combinations also to operate at up to 38 tonnes on 5 or more axles for general haulage** (as well as up to 44 tonnes on 6 axles and road friendly suspensions when operating intermodally).

Dimensions

27. **The Government is not proposing to change the maximum dimensions of lorries in any way; heavier lorries for combined transport would be no bigger than lorries currently on the road.** Most 38 tonne vehicles used in the UK are of

the maximum length, height and width permitted by the EC and are designed to operate at higher weights.

Effect of the proposal on the environment

28. The proposed increase in maximum lorry weights would have two potential effects. First, where goods are already carried by road to and from railheads, the same weight of goods could be carried in fewer lorries. Second, existing goods carried throughout by road may be diverted to rail for part of the journey, and new business may use combined transport that would otherwise use road throughout. Long-distance road hauls could therefore be avoided in favour of relatively short hauls to and from railheads with trunk haul by rail.

29. The general effect could be to reduce lorry mileage on our roads, though there could be some increase in lorry traffic near railheads. This net reduction in mileage would in turn mean less vehicle emissions, less noise and fewer lorries to be seen. Whatever their weight, the lorries would still have to comply with existing EC emission and noise standards. It is not possible to give any quantified estimates of these benefits. They would depend on how far and how quickly operators decided to invest in suitable vehicles to take advantage of the weight concessions.

Legislation and Timing

30. Rates of Vehicle Excise Duty for any categories of heavier vehicles will be set in a Budget.

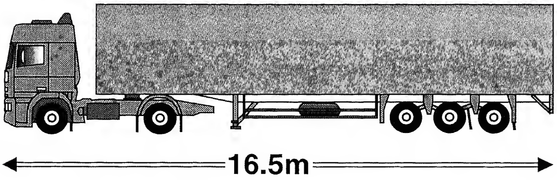
31. Any changes in vehicle weights will be implemented through Regulations. After considering the views expressed in response to this consultation paper, the Government would need to circulate draft regulations this summer for public comment. A further 6 weeks would be allowed for consultation on these detailed regulations. European Community obligations require consultation also to include other Member States of the Community. This Community consultation has to be carried out within fixed timescales. The regulations would be unlikely to come into effect until the beginning of 1994.

You are invited to comment on the proposal described in this paper. Written comments should be submitted to arrive not later than 30th April 1993 to:

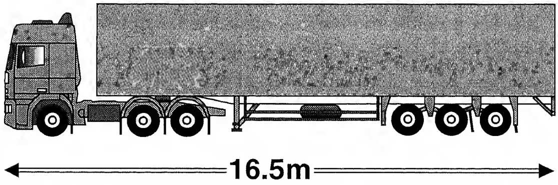
The Department of Transport
Room S16/03
2 Marsham St
London SW1P 3EB

HEAVY LORRIES - VEHICLE SIZE

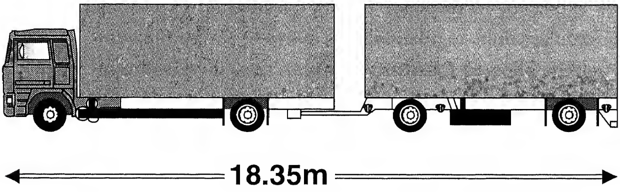
An increase in vehicle weights does not entail an increase in vehicle size



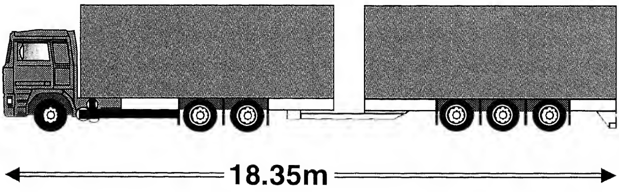
38 tonne 5 axle artic



44 tonne 6 axle artic



35 tonne 4 axle vehicle/ drawbar combination



44 tonne 6 axle vehicle/ drawbar combination

Blue = Vehicles currently in use

Green = Proposed new vehicles for combined transport

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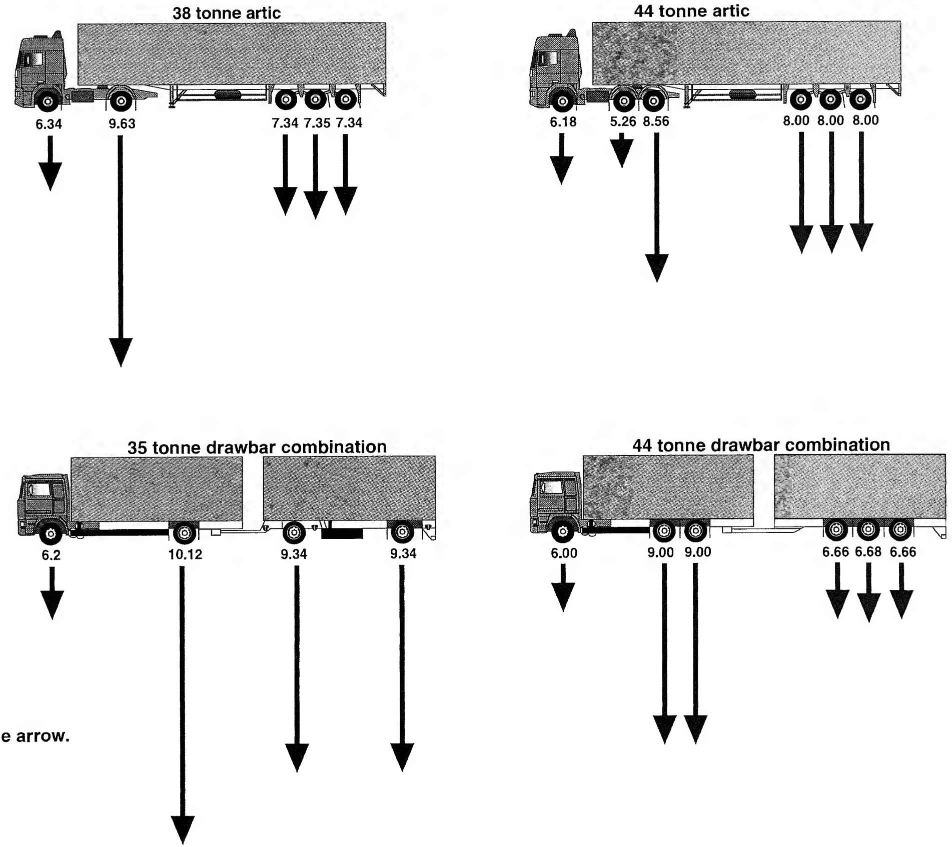
Appendix 2

COMPARISON OF THE ROAD WEAR EFFECTS OF VARIOUS LARGE GOODS VEHICLES



Blue = Vehicles currently in use

Green = Proposed new vehicles for combined transport

The number below each wheel shows axle weights.
Road wear is proportional to the weight of an axle
raised to its 4th power and is shown by the **length of the arrow.**

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